at Gesupur, about 100 miles south of Dehra Dûn, it amounts to 0·020; and if the diminution continues at the same rate $(g''_0 - \gamma_0)$, will change sign at about 150 miles from that place.

The pendulum observations do not as yet go far enough to give any evidence as to the maximum value which $(g''_0 - \gamma_0)$ will attain, nor as to the position of the crest of the invisible chain of high density.

This is the only line on which the stations are sufficiently near together to give a definite idea of the form of any part of the hidden chain, and more stations, not too far apart—say at intervals of about 20 miles—are urgently required to determine the position and height of the crest, and to reveal the section of the southern slopes.

The general conclusion to be derived from the pendulum observations, as far as they have yet gone, confirms Colonel Burrard's theory of the distribution of mass in the Himalayas and the plains below them. The mountains are compensated to some extent, but by no means wholly; and there does exist a belt of high density running parallel to the Himalayas, and some 200 or 300 miles from them. The effects, however, which Colonel Burrard attributed to the "hidden chain" must, it now appears, be ascribed only in part to that cause and in part to the deep "ditch" which lies between the hidden chain and the foot of the hills.

1909 *March* 3.

A proposal for the Comparison of the Stellar Magnitude Scales of the different Observatories taking part in the Astrographic Catalogue. By H. H. Turner, D.Sc., F.R.S., Savilian Professor.

1. One of the questions on the programme for the forthcoming meeting of the Comité Permanent for the Astrographic Catalogue (summoned for April 18–24 in Paris) is that of the best method for coordinating the measures of stellar magnitude. The different observatories have adopted different procedures, and the task of forming a homogeneous system is not by any means easy.

By the arrangement of the work, there is a zone 1° in breadth common to each pair of observatories at the separating belts; and hence there is material for a comparison of the two scales; but this implies the identification of images of the same star, which in itself involves a good deal of labour.

2. The proposal I wish to advocate is of a very simple character, and at the same time it will probably provide a sufficiently good comparison of the scales, with comparatively little labour. It is—*That the number of images recorded under each unit of the magnitude scale be counted and tabulated.*

The illustrations which follow will be sufficient to show the advantages to be gained by this simple process. They are to be regarded as illustrations merely, and not as definitive results; and they are set down rather hurriedly at this moment, in order to have some information ready for the Committee.

The Oxford Results.

3. Naturally, we have paid most attention to our own results, and these may be given first. At Oxford the diameters of the images are estimated in units of 0″·3, allowance being made for the greyness of the images of the fainter stars. But it was difficult to lay down exact rules in this respect, and the various measurers have differed a good deal in their practice. It is thus natural to treat their measures separately; and the way in which their idiosyncrasies are made apparent is a very good illustration of the value of the method.

TABLE I.

Measures of B.G. in Zone +30°.

d.	n_0.	log n_0.	log n_c.	O_1—C_1.	Dec. Eqn.	O_2—C_2.
15	818	2·91	3·07	−·16	+·24	+·08
16	579	2·76	3·01	−·25	+·30	+·05
17	471	2·67	2·94	−·27	+·18	−·09
18	458	2·66	2·87	−·21	+·22	+·01
19	499	2·70	2·80	−·10	+·17	+·07
20	1035	3·01	2·72	+·29	−·36	−·07
21	603	2·78	2·65	+·13	−·18	−·05
22	762	2·88	2·59	+·29	−·31	−·02
23	407	2·61	2·52	+·09	−·05	+·04
24	186	2·27	2·46	−·19	+·14	−·05
25	118	2·07	2·40	−·33	+·24	−·09
26	100	2·00	2·34	−·34	+·30	−·04
27	155	2·19	2·28	−·09	+·18	+·09
28	101	2·00	2·22	−·22	+·22	·00
29	86	1·93	2·17	−·24	+·17	−·07
30	362	2·56	2·12	+·44	−·36	+·08
31	204	2·31	2·07	+·24	−·18	+·06
32	226	2·35	2·01	+·34	−·31	+·03
33	92	1·96	1·95	+·01	−·05	−·04
34	65	1·81	1·90	−·09	+·14	+·05

4. In Table I. are given the number of times (n_0) on which B.G. recorded the value of d given in the first column, between $d = 15$ and $d = 34$. Outside these limits the numbers become small or irregular, and we need not notice them at present. In the third column we take the logarithm of n_0, which is the suitable function, since we are clearly dealing with percentages, *i.e.* with $\Delta n_0/n_0$, the integral of which is $\log n_0$. In the fourth column values of $\log n_c$ are given from a smooth curve, and it will be obvious that the residuals in the fifth column originate with the observer, and not with the stars. The most conspicuous tendency is to record terminal digits 0–3 rather than 4–9.

In fact B.G. has a well-marked "decimal equation," which we may exhibit as follows:—

TABLE II.

B.G.'s Decimal Equation for Zone +30°.

Terminal Unit.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.
O—C 15–24	+·29	+·13	+·29	+·09	−·19	−·16	−·25	−·27	−·21	−·10
O—C 25–34	+·44	+·24	+·34	+·01	−·09	−·33	−·34	−·09	−·22	−·24
Mean	+·36	+·18	+·31	+·05	−·14	−·24	−·30	−·18	−·22	−·17

5. The two sets differ a little, and indeed there is no reason why an observer should treat 15 and 16 exactly as he treats 25 and 26. But it is obvious that the decimal equation is the main feature of his idiosyncrasy; and on correcting for the mean, as in column 6 of Table I., we get the much improved residuals of column 7. These suggest a correction to the curve, but the complete discussion would take us too far for the present purpose, which is merely to make clear that these counts can be profitably studied.

6. As a second example we will consider the whole of B.G.'s measures (not merely those between $d = 15$ and $d = 34$) in different hour angles; but to give every separate value of d is unnecessary at present. We may group values of d as in Table III., the groups corresponding to magnitudes increasing uniformly, if we adopt the formula (used at Greenwich and Oxford),

$$\text{mag.} = a - b\sqrt{d}.$$

Further, instead of using n, the number under each heading, it is more convenient to use N, the number brighter than and including that heading; or rather log N, as Kapteyn has already done. The details will be clear from Table III.

7. The first column gives the values of the diameter d, the second the mean value of $\sqrt{d}$, which decreases with tolerable uniformity by about 0·4 each time, corresponding to half-a-magnitude.

TABLE III.

B.G.'s Measures of Diameter in Zone +30°.

d.	√d.	R.A. 0^h–$4\frac{1}{2}^h$. n_1.	N_1.	log N_1.	R.A. 4·57–6·36. n_2.	N_2.	log N_2.	log N_2– log N_1.	Diff. from Mean.	Approx. Mag.
50 and over	>7·1	13	13	1·11	23	23	1·36	+0·25	+·02	> 7·0
45 to 49	6·8	2	15	1·18	11	34	1·53	+0·35	+·12	7·3
40 ,, 44	6·5	22	37	1·57	36	70	1·84	+ ·27	+·04	7·7
35 ,, 39	6·1	11	48	1·68	16	86	1·93	+ ·25	+·02	8·2
30 ,, 34	5·6	65	113	2·05	101	187	2·27	+ ·22	−·01	8·7
26 ,, 29	5·2	36	149	2·17	53	240	2·38	+ ·21	−·02	9·2
22 ,, 25	4·8	100	249	2·40	125	365	2·56	+ ·16	−·07	9·7
18 ,, 21	4·4	131	380	2·58	252	617	2·79	+ ·21	−·02	10·2
15 ,, 17	4·0	93	473	2·67	217	834	2·92	+ ·25	+·02	10·7
12 ,, 14	3·6	298	771	2·89	575	1409	3·15	+ ·26	+·03	11·2
9 ,, 11	3·2	565	1336	3·13	762	2171	3·34	+ ·21	−·02	11·7
7 and 8	2·7	115	1451	3·16	33	2204	3·34	+ ·18	−·05	12·0
5 ,, 6	2·3	1	1452	3·16	0	2204	3·34	+ ·18	−·05	12·2

The third column gives the number of records in each group for plates in R.A. 0^h–$4\frac{1}{2}^h$, away from the Milky Way.

The fourth column is formed by continual addition of the items of the third, and in the fifth the logarithm is taken.

The sixth, seventh, and eighth columns show similar figures for plates in the Milky Way.

8. In the ninth column the differences of log N are taken, and in the tenth the residuals from a mean of +0·23. This mean difference signifies nothing beyond the fact that more measures were made in the second set than in the first, and it may be neglected. The tenth column shows us, on the hypothesis that the irregularities of B.G.'s scale have been eliminated by the subtraction, how the stars increase in the Milky Way compared with the increase in a non-Galactic region. Now these numbers are no doubt rough: they depend on a few plates only, measured by a measurer with strongly marked bias; but they seem to indicate that log N_2–log N_1 does not *increase* for the fainter stars, as Kapteyn has found. The approximate magnitude corresponding to the diameter is given in the eleventh column, and we may extract from Kapteyn's recent important paper (No. 18 of the *Groningen Publications*) the following values for log N in the Galaxy and out of it (Table IV.). We see that the difference for Galaxy–non-Galaxy increases by 0·138 in 4 magnitudes, whereas we get a decrease if anything.

TABLE IV. (*Kapteyn*).

Mag.	log N_0^{20}.	log N_{20}^{40}.	Diff.
8·0	0·199	9·998	+·201
9·0	0·696	0·468	+·228
10·0	1·187	0·924	+·263
11·0	1·668	1·368	+·300
12·0	2·138	1·799	+·339

9. So marked a difference from Kapteyn seemed worth checking by the independent measures of another observer in another zone; and accordingly the measures of a few plates by T.M. in zone +29° were taken as below.

TABLE V.

Log N from Measures by T.M. in Zone +29°.

Approx. Mag.	Galaxy.	Non.-Gal.	Diff.	Add ·16.	B.G. from Table III.
<7·0	1·23	1·53	−·30	−·14	+·02
7·3	1·49	1·61	−·12	+·04	+·12
7·7	1·67	1·80	−·13	+·03	+·04
8·2	1·86	1·96	−·10	+·06	+·02
8·7	2·04	2·19	−·15	+·01	−·01
9·2	2·15	2·34	−·19	−·03	−·02
9·7	2·32	2·50	−·18	−·02	−·07
10·2	2·57	2·71	−·14	+·02	−·02
10·7	2·69	2·84	−·15	+·01	+·02
11·2	2·93	3·08	−·15	+·01	+·03
11·7	3·09	3·26	−·17	−·01	−·02
12·2	3·23	3·40	−·17	−·01	−·05
12·7	3·40	3·53	−·13	+·03	

10. Table V. needs little explanation: log N is formed in the second column for plates in the Galaxy, and in the third for plates away from it. The differences in column 4 should increase, but they remain very nearly constant; such slight residuals as are shown in column 5 having several features in common with the corresponding numbers of B.G., and confirming the decrease, rather than increase, found before.

11. Such a cursory examination is of course insufficient for any purpose beyond that of demonstrating the importance of discussing these star counts. We see that, defective as B.G.'s magnitude scale is from many points of view, it still serves to compare different parts of the sky when it is converted into the scale of log N.

12. But it may be said that the Oxford measures are exceptional, and that other observatories have used magnitude scales which do not show idiosyncrasies of the same kind. Accordingly, the results of a few other observatories have been examined in a purely provisional manner, and the outcome is given below.

The Greenwich Results.

13. The Greenwich methods are very similar to the Oxford methods, with one exception in detail. Two measures of diameter are made, in reversed positions of the plate: at Oxford we print the mean of the two, but at Greenwich the sum is printed. Now this leads to

a curious result. In Table VI. are given counts of the Greenwich stars for the zone $+64°$, for different values of d. The divisions of the groups are of no particular significance, the meaning being simply that a page of computations was filled up and another begun: but the groups follow in order, and are kept separate in order to show the persistence of the curious feature to which attention is now called, viz. that there are very few *odd* values of d, almost all the tabulated sums being even.

TABLE VI.

Greenwich Values of Diameter: Zone $+64°$.

d.	I.	II.	III.	IV.	Total.	*d.*	I.	II.	III.	IV.	Total.
4	3	3	20	40	66	16	48	56	66	41	211
5	3	2	4	59	68	17	13	10	6	17	46
6	29	19	63	130	241	18	45	52	58	43	198
7	16	27	11	38	92	19	8	7	6	18	39
8	51	46	122	117	336	20	41	52	47	35	175
9	17	13	22	35	87	21	10	5	8	17	40
10	85	100	130	81	396	22	27	34	44	21	126
11	15	14	9	27	65	23	8	6	6	10	30
12	66	65	118	84	333	24	28	30	36	36	130
13	16	9	7	27	59	25	8	6	5	7	26
14	62	70	90	61	283	26	33	23	31	23	110
15	11	10	12	26	59	etc.					

14. Such a peculiarity may arise in various ways, of which two at least are worthy of attention.

(*a*) The measurers may have a tendency to put down even numbers only, in which case the sum will of course be even.

(*b*) The two measures may not be independent. If there is any tendency to repeat the first in the second, the sum will of course tend to be even.

15. In order to see whether (*a*) is possibly a general habit, sums of the two values of d were formed for a few Oxford plates measured by different people, and the number of odd sums compared with the number of even sums. The results are given in Table VII.

TABLE VII.

Comparison of Odd and Even Sums of d *for Oxford Measures.*

Measurer.	Odd Sums.	Even Sums.
H.T.	70	70
F.B.	185	197
B.G.	69	176
E.G.	261	257

The only observer showing a tendency to even sums is B.G.; and his separate entries were then examined. It was found that he made 370 even entries as against 127 odd, so that he comes under head (*a*) above.

16. The measurers of the Greenwich plates are not indicated in the volume, so that it is not possible to study their relative habits. But this could be done at the observatory, where records are doubtless kept; and probably results of interest would be obtained in this way.

The Potsdam Results.

17. The Potsdam results have been recorded in magnitudes. Counts have been made on the plates in vol i., which are in miscellaneous order; and only the general nature of the scale is manifested. The subdivision is practically into quarter magnitudes, as shown in the first column of Table VIII. In the next six columns are given separate results for six consecutive groups of plates, in order to show the persistence of the special features, which are seen more clearly in the 8th. column of totals, where it will be noticed that the numbers are alternately large and small. Nevertheless, log N shown in the 10th. column agrees fairly well with Kapteyn's log N_0^{90}, when a constant 2·30 is added to secure approximate adjustment.

TABLE VIII.

Potsdam Results.

Mag.	I.	II.	III.	IV.	V.	VI.	Total n.	N.	log N.	Kapteyn log N_0^{90} +2·30	P–K.
<8·0	21	36	19	11	8	17	112	112	2·05		
8·0	5	39	7	13	9	13	86	198	2·30	2·35	– ·05
8·2	6	25	10	4	3	9	57	255	2·41	2·47	– ·06
8·5	16	51	26	23	7	12	135	390	2·59	2·59	·00
8·8	14	28	14	11	8	6	81	471	2·67	2·71	– ·04
9·0	69	128	39	43	17	39	335	806	2·91	2·83	+ ·08
9·2	35	89	27	34	13	23	221	1027	3·01	2·95	+ ·06
9·5	110	149	29	40	39	28	395	1422	3·15	3·06	+ ·09
9·8	59	107	46	44	13	35	304	1726	3·24	3·18	+ ·06
10·0	164	170	74	79	47	72	606	2332	3·37	3·30	+ ·07
10·2	33	115	55	52	25	40	320	2652	3·42	3·42	·00
10·5	119	173	121	127	76	90	706	3358	3·53	3·53	·07
10·8	32	92	61	76	23	51	335	3693	3·57	3·64	– ·07
11·0	96	174	216	190	168	172	1016	4709	3·67	3·75	– 08

18. There is apparently a rather sudden discontinuity in the Potsdam scale near magnitude 9·0, and a tolerably sharp drop after magnitude 10·0.

19. It seems worth inquiring whether the Potsdam results show

differences between the Galaxy and the non-Galaxy similar to those shown at Oxford.

Group II. is roughly a Galactic region, and groups IV. and V. are non-Galactic.

TABLE IX.

Potsdam Results.

Mag.	Galactic. n_2.	N_2.	log N_2.	Non-Galactic. n_1.	N_1.	log N_1.	log N_2 − log N_1.	Sub. 0·27.
< 8·0	36	36	1·56	19	19	1·28	+0·28	+·01
8·0	39	75	1·88	22	41	1·61	+ ·27	·00
8·2	25	100	2·00	7	48	1·68	+ ·32	+·05
8·5	51	151	2·18	30	78	1·89	+ ·29	+·02
8·8	28	179	2·25	19	97	1·99	+ ·26	−·01
9·0	128	307	2·49	60	157	2·20	+ ·29	+·02
9·2	89	396	2·60	47	204	2·31	+ ·29	+·02
9·5	149	545	2·74	79	283	2·45	+ ·29	+·02
9·8	107	652	2·81	57	340	2·53	+ ·28	+·01
10·0	170	822	2·91	126	466	2·67	+ ·24	−·03
10·2	115	937	2·97	77	543	2·73	+ ·24	−·03
10·5	173	1110	3·05	203	746	2·87	+ ·18	−·09
10·8	92	1202	3·08	99	845	2·93	+ ·15	−·12
11·0	174	1376	3·14	358	1203	3·08	+ ·06	−·21

Forming log N for these portions, and taking the differences in the sense Galaxy–non-Galaxy, the differences certainly do not seem to *increase.* We thus seem to find an essential difference from Kapteyn's results. Is it due to our using photographic magnitudes instead of visual? The point is well worth careful investigation, and it seems clear that a good deal can be learnt from these simple counts, although the magnitude scales may be defective in different ways. It seems quite possible that we are here in presence of a physical fact connected with the scattering of light in space, as outlined last November (*Monthly Notices,* vol. lxix. p. 61). It was pointed out that a crucial test of such scattering would be to photograph the stars in visual light, and compare the increase in time of exposure with that required for violet light. M. Tikhoff has since applied this test with success (see *Comptes Rendus* for February 1), and considers this differential effect established; so that we may expect fundamental differences between visual and photographic magnitudes, and the point above noted may be one manifestation of them.

The Toulouse Results.

20. Volume ii. was selected at random, containing the results in +9°; and counts were made of the plates in the order of R.A.

The first set of plates in Table X. represent earlier R.A.'s, and are therefore further from the Galaxy; the second set are nearer the Galaxy, though they stop short of it. The differences of log N here show a distinct increase from magnitude 8·0 to 10·0, but then decrease again. It seems probable that a much more extensive investigation is needed to get at the facts clearly.

21. As regards the Toulouse scale, it will be seen that the values of N for 8·0, 9·0, 10·0, and 11·0 show excesses over their neighbours; and there is doubtless some reason for this idiosyncrasy. But the reason can be most profitably studied at the observatory itself, when once these counts have been made and tabulated.

Table X.

Toulouse Results.

Mag.	Group I. Non-Galactic.			Group II. Near Galactic.			log N_2 − log N_1.	Add 0·20.
	n_1.	N_1.	log N_1.	n_2.	N_2.	log N_2.		
<8·0	73	73	1·86	39	39	1·59	−0·27	−·07
8·0	28	101	2·00	20	59	1·77	− ·23	− 03
8·2	6	107	2·03	4	63	1·80	− ·23	−·03
8·5	20	127	2·10	14	77	1·89	− ·21	−·01
8·8	27	154	2·19	14	91	1·96	− ·23	−·03
9·0	62	216	2·33	44	135	2·13	− ·20	·00
9·2	37	253	2·40	23	158	2·20	− ·20	·00
9·5	51	304	2·48	56	214	2·33	− ·15	+·05
9·8	72	376	2·58	42	256	2·41	− ·17	+·03
10·0	117	493	2·69	121	377	2·58	− ·11	+·09
10·2	77	570	2·76	49	426	2·63	− ·13	+·07
10·5	155	725	2·86	80	506	2·70	− ·16	+·04
10·8	162	887	2·95	67	573	2·76	− ·19	+·01
11·0	434	1321	3·12	271	844	2·93	− ·19	+·01
11·2	380	1701	3·23	186	1030	3·01	− ·22	−·02
11·5	474	2175	3·34	261	1291	3·11	− ·23	−·03
11·8	482	2657	3·42	287	1578	3·20	− ·22	−·02
12·0	376	3033	3·48	260	1838	3·26	− ·22	−·02
12·3	533	3566	3·55	523	2361	3·37	− ·18	+·02

The Helsingfors Results.

22. The results have been reduced to a magnitude scale which shows great smoothness to magnitude 10·6 or 10·7. The numbers then fall off, indicating a systematic error for the faintest stars. The plates counted were those at $6^h\ 0^m$ for zones $+40°$, $+42°$, $+44°$, and

$+46°$, which are near the Galaxy; and 10 plates from $8° 35^m + 45°$ to $8^h 50^m + 42°$, which are at some distance away. The differences $\log N_2 - \log N_1$ show no increase between 8·5 and 11·0; and though there is a curvature shown, it is in the opposite direction to that of the Toulouse results.

TABLE XI.

Helsingfors.

Mag.	Galactic.			Non-Galactic.			$\log N_2 - \log N_1$.
	n_2.	N_2.	$\log N_2$.	n_1.	N_1.	$\log N_1$.	
to 8·5	85	85	1·93	75	75	1·88	+0·05
8·6	17			20			
8·7	21			11			
8·8	29			23			
8·9	32			26			
9·0	27	211	2·32	30	185	2·27	+0·05
9·1	25			47			
9·2	36			53			
9·3	21			49			
9·4	37			37			
9·5	30	360	2·56	45	416	2·62	−0·06
9·6	36			33			
9·7	47			34			
9·8	41			46			
9·9	44			46			
10·0	41	569	2·76	35	610	2·79	−0·03
10·1	41			43			
10·2	47			37			
10·3	50			55			
10·4	69			56			
10·5	77	853	2·93	57	858	2·93	0·00
10·6	94			81			
10·7	91			43			
10·8	69			73			
10·9	76			67			
11·0	55	1238	3·09	43	1165	3·07	+0·02
11·1	74			34			
over 11·1	34			39			

The Paris Results.

The scale used is one of magnitudes, but the following figures will show that the scale is not uniform. They refer to the first four plates in zone +23°.

TABLE XII.

Mag.	n.	Mag.	n.
< 9·0	108		
9·1	14	10·1	54
9·2	22	10·2	56
9·3	31	10·3	26
9·4	18	10·4	29
9·5	12	10·5	34
9·6	18	10·6	188
9·7	48	10·7	20
9·8	28	10·8	29
9·9	26	10·9	33
10·0	37	11·0	253

Summary.

1. It is suggested that the observatories taking part in the Astrographic Catalogue shall make systematic counts of the numbers of images shown under each division of their magnitude scales.

2. These counts will generally indicate systematic errors in the scales which can be best investigated at the observatory, since some of them may depend on conditions not recorded in the published volumes—change of measurer, for instance.

3. But with such counts before us, even without systematic correction, it is possible to get important information as to the relation of one part of the sky to another.

4. In particular, Kapteyn finds the Galaxy relatively richer in faint stars than the non-Galactic parts of the sky. Counts on the Oxford, Potsdam, Toulouse, and Helsingfors plates fail to support this conclusion. This seems to point to a fundamental difference between visual and photographic magnitudes, possibly due to scattering of light in space.

Some Notes on Aberration. By H. H. Turner, D.Sc. F.R.S.,
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1. It may be stated at the outset that the net result of the following discussion is to come back to the starting-point. It is the account of a train of thought, in the course of which a new departure was suggested more than once, only to prove misleading; and the only reason for printing the account is that it may possibly save others from some of the pitfalls which were noticed (generally by falling into them). It may seem presumptuous to think that others will not be more wary; but on at least one occasion I have found the opinion of others, familiar with the subject, to agree with mine, although this has ultimately proved erroneous. I do not wish, by saying this, to shirk responsibility for the mistakes made, but only to strengthen the case for printing this record of certain seductive errors and their exposure.

2. The keynote of the discussion is the following question, to which my attention was originally drawn by reading a most interesting chapter in Mr. N. R. Campbell's book, *Modern Electrical Theory*, Camb. Un. Press, 1907.

Does the correction for aberration in the position of an observed heavenly body P depend on the velocity of the observer *relative to* P, or upon his absolute velocity in space?

Our instinct is to reject the second alternative, because our knowledge of all motion can only be relative. Even the introduction of the notion of the ether, which enables us to talk of the Earth's motion "relatively to the ether," instead of the "absolute motion in space," is not altogether satisfactory. But if aberration depends on the relative motion of observer and star, into which the motion of the star enters just as much as that of the Earth, how is it that we correct for the motion of the Earth in its orbit, and neglect the motion of the star which may also be moving in an orbit? At first sight it certainly seems as though we are concerned specially with the absolute motion of the Earth, or something very like it.

3. But the difficulty is to devise a test which shall distinguish between the two hypotheses. This looks at first sight an easy matter, but it is not so, as will presently appear. The following test suggested itself to me, and was judged sound by others:—

Let A C B, fig. 1, be the equatorial section of the Sun; A and B the positions of a spot when it is just appearing and just disappearing; C its position on the centre of the disc. If aberration depends on relative velocity (*i.e.* on the velocity of the source of light just as much as on that of the recipient, only in the reverse direction of course), then the velocity of the spot across the line of sight at C should displace it aberrationally, while at A and B there would be no effect of that kind. Hence, if the heliographic longitude of the spot observed at C be compared with the mean of those at A and B,